

specified period of time, the Commission may require the licensee to suspend operation until the changes are completed.

(e) *Interference dispute resolution procedures.* Should a licensee licensed under this part receive harmful interference from another licensee licensed under this chapter, the parties involved shall comply with the dispute resolution procedures set forth herein:

(1) The licensee experiencing the harmful interference shall notify the licensee believed to be causing the harmful interference and shall supply information describing its problem and supporting its claim;

(2) Upon receipt of the harmful interference notice, the licensee alleged to be causing the harmful interference shall respond immediately and make every reasonable effort to identify and resolve the conflict; and

(3) Licensees are encouraged to resolve the harmful interference prior to contacting the Commission.

[61 FR 26677, May 28, 1996, as amended at 63 FR 68983, Dec. 14, 1998; 65 FR 17449, Apr. 3, 2000; 65 FR 38329, June 20, 2000]

**§ 101.107 Frequency tolerance.**

(a) The carrier frequency of each transmitter authorized in these services must be maintained within the following percentage of the reference frequency except as otherwise provided in paragraph (b) of this section or in the applicable subpart of this part (unless otherwise specified in the instrument of station authorization the reference frequency will be deemed to be the assigned frequency):

Frequency (MHz)	Frequency Tolerance (percent)		
	All fixed and base stations	Mobile stations over 3 watts	Mobile stations 3 watts or less
928 to 929 <sup>2,5</sup> .....	0.0005	.....	.....
932 to 932.5 <sup>2</sup> .....	0.00015	.....	.....
932.5 to 935 <sup>2</sup> .....	0.00025	.....	.....
941 to 941.5 .....	0.00015	.....	.....
941.5 to 944 .....	0.00025	.....	.....
952 to 960 <sup>7</sup> .....	.....	.....	.....
944.0 to 1,000 .....	0.0005	0.0005	0.0005
1,850 to 1,990 .....	0.002	.....	.....
2,110 to 2,200 .....	0.001	.....	.....
2,200 to 12,200 <sup>1,3</sup> ..	0.005	0.005	0.005
2,450 to 2,500 .....	0.001	.....	.....
3,700 to 4,200 .....	0.005	.....	.....
5,925 to 6,875 .....	0.005	.....	.....
10,550 to 11,700 .....	0.005	.....	.....
12,200 to 13,250 <sup>6</sup> ...	0.005	.....	.....

Frequency (MHz)	Frequency Tolerance (percent)		
	All fixed and base stations	Mobile stations over 3 watts	Mobile stations 3 watts or less
12,200 to 17,700 .....	0.03	0.03	0.03
17,700 to 18,820 <sup>4,5</sup> .....	0.003	.....	.....
18,820 to 18,920 <sup>4,5</sup> .....	0.001	.....	.....
18,920 to 19,700 <sup>4,5</sup> .....	0.003	.....	.....
19,700 to 27,500 <sup>6</sup> ...	0.03	.....	.....
27,500 to 28,350 .....	0.001	.....	.....
29,100 to 29,250 .....	0.001	.....	.....
31,000 to 31,075 <sup>8</sup> ...	0.001	.....	.....
31,075 to 31,225 <sup>8</sup> ...	0.001	.....	.....
31,225 to 31,300 <sup>8</sup> ...	0.001	.....	.....
31,300 to 40,000 <sup>6</sup> ...	0.03 <sup>9</sup>	0.03	0.03

<sup>1</sup>Applicable only to common carrier LTTS stations. Beginning Aug. 9, 1975, this tolerance will govern the marketing of LTTS equipment and the issuance of all such authorizations for new radio equipment. Until that date new equipment may be authorized with a frequency tolerance of .03 percent in the frequency range 2,200 to 10,500 MHz and .05 percent in the range 10,500 MHz to 12,200 MHz, and equipment so authorized may continue to be used for its life provided that it does not cause interference to the operation of any other licensee.

<sup>2</sup>Equipment authorized to be operated on frequencies between 890 and 940 MHz as of Oct. 15, 1956, must maintain a frequency tolerance within 0.03 percent subject to the condition that no harmful interference is caused to any other radio station.

<sup>3</sup>See subpart G of this part for the stability requirements for transmitters used in the Digital Electronic Message Service.

<sup>4</sup>Existing authorized equipment with a frequency tolerance of  $\pm 0.03\%$  may be marketed until December 1, 1988. Equipment installed and operated prior to December 1, 1988 may continue to operate after that date with a minimum frequency tolerance of  $\pm 0.03\%$ . However, the replacement of equipment requires that the  $\pm 0.003\%$  tolerance be met.

<sup>5</sup>For remote stations with 12.5 KHz bandwidth, the tolerance is  $\pm 0.00015\%$ .

<sup>6</sup>Applicable to private operational fixed point-to-point microwave only. For exceptions see § 101.147.

<sup>7</sup>For private operational fixed point-to-point microwave systems, with a channel greater than or equal to 50 KHz bandwidth,  $\pm 0.0005\%$ ; for multiple address master stations, regardless of bandwidth,  $\pm 0.00015\%$ ; for multiple address remote stations with 12.5 KHz bandwidths,  $\pm 0.00015\%$ ; for multiple address remote stations with channels greater than 12.5 KHz bandwidth,  $\pm 0.0005\%$ .

<sup>8</sup>For stations authorized prior to March 11, 1997, and for non-Local Multipoint Distribution Service stations authorized pursuant to applications refilled no later than June 26, 1998, the transmitter frequency tolerance shall not exceed 0.030 percent.

<sup>9</sup>Equipment authorized to be operated in the 38,600–40,000 MHz band is exempt from the frequency tolerance requirement noted in the above table.

(b) Heterodyne microwave radio systems may be authorized at a somewhat less restrictive frequency tolerance (up to .01 percent) to compensate for frequency shift caused by numerous repeaters between base band signal insertion. Where such relaxation is sought, applicant must provide all calculations and indicate the desired tolerance over each path. In such instances the radio transmitters and receivers used must individually be capable of complying with the tolerance specified in paragraph (a) of this section. Heterodyne operation is restricted to channel bandwidth of 10 MHz or greater.

## Federal Communications Commission

## § 101.111

(c) As an additional requirement in any band where the Commission makes assignments according to a specified channel plan, provisions must be made to prevent the emission included within the occupied bandwidth from radiating outside the assigned channel at a level greater than that specified in § 101.111.

[61 FR 26677, May 28, 1996, as amended at 62 FR 23167, Apr. 29, 1997; 63 FR 6105, Feb. 6, 1998; 63 FR 9448, Feb. 25, 1998; 63 FR 14039, Mar. 24, 1998; 63 FR 36611, July 7, 1998]

### § 101.109 Bandwidth.

(a) Each authorization issued pursuant to these rules will show, as the emission designator, a symbol representing the class of emission which must be prefixed by a number specifying the necessary bandwidth. This figure does not necessarily indicate the bandwidth actually occupied by the emission at any instant. In those cases where part 2 of this chapter does not provide a formula for the computation of the necessary bandwidth, the occupied bandwidth may be used in the emission designator.

(b) Stations in this service will be authorized any type of emission, method of modulation, and transmission characteristic, consistent with efficient use of the spectrum and good engineering practice, except that Type B, damped-wave emission will not be authorized.

(c) The maximum bandwidth which will be authorized per frequency assigned is set out in the table that follows. Regardless of the maximum authorized bandwidth specified for each frequency band, the Commission reserves the right to issue a license for less than the maximum bandwidth if it appears that a lesser bandwidth would be sufficient to support an applicant's intended communications.

Frequency band (MHz)	Maximum authorized bandwidth
928 to 929 .....	25 kHz <sup>1 5 6</sup>
932 to 932.5, 941 to 941.5 ....	12.5 kHz <sup>1 5 6</sup>
932.5 to 935, 941.5 to 944 ....	200 kHz <sup>1</sup>
952 to 960 .....	200 KHz <sup>1 5 6</sup>
1,850 to 1,990 .....	10 MHz <sup>1</sup>
2,110 to 2,130 .....	3.5 MHz
2,130 to 2,150 .....	800 or 1600 KHz <sup>1</sup>
2,150 to 2,160 .....	10 MHz
2,160 to 2,180 .....	3.5 MHz
2,180 to 2,200 .....	800 or 1600 KHz <sup>1</sup>
2,450 to 2,483.5 .....	625 KHz <sup>2</sup>
2,483.5 to 2,500 .....	800 KHz

Frequency band (MHz)	Maximum authorized bandwidth
3,700 to 4,200 .....	20 MHz
5,925 to 6,425 .....	30 MHz <sup>1</sup>
6,425 to 6,525 .....	25 MHz
6,525 to 6,875 .....	10 MHz <sup>1</sup>
10,550 to 10,680 .....	5 MHz <sup>1</sup>
10,700 to 11,700 .....	40 MHz <sup>1</sup>
12,200 to 12,700 .....	20 MHz <sup>1</sup>
13,200 to 13,250 .....	25 MHz
17,700 to 18,140 .....	220 MHz <sup>1</sup>
18,140 to 18,142 .....	2 MHz
18,142 to 18,580 .....	6 MHz
18,580 to 18,820 .....	20 MHz <sup>1</sup>
18,820 to 18,920 .....	10 MHz
18,920 to 19,160 .....	20 MHz <sup>1</sup>
19,160 to 19,260 .....	10 MHz
19,260 to 19,700 .....	220 MHz <sup>1</sup>
21,200 to 23,600 .....	100 MHz <sup>4</sup>
24,250 to 25,250 .....	40 MHz
27,500 to 28,350 .....	850 MHz
29,100 to 29,250 .....	150 MHz
31,000 to 31,075 .....	75 MHz
31,075 to 31,225 .....	150 MHz
31,225 to 31,300 .....	75 MHz
38,600 to 40,000 .....	50 MHz <sup>7</sup>
Above 40,000 .....	( <sup>3</sup> )

<sup>1</sup> The maximum bandwidth that will be authorized for each particular frequency in this band is detailed in the appropriate frequency table in § 101.147. If contiguous channels are aggregated in the 928–928.85/952–952.85/956.25–956.45 MHz, the 928.85–929/959.85–960 MHz, or the 932–932.5/941–941.5 MHz bands, then the bandwidth may exceed that which is listed in the table.

<sup>2</sup> 1250 KHz, 1875 KHz, or 2500 KHz on a case-by-case basis.

<sup>3</sup> To be specified in authorization.

<sup>4</sup> For exceptions, see § 101.147(s).

<sup>5</sup> A 12.5 kHz bandwidth applies only to frequencies listed in § 101.147(b)(1) through (4).

<sup>6</sup> For frequencies listed in § 101.147(b)(1) through (4), consideration will be given on a case-by-case basis to authorizing bandwidths up to 50 KHz.

<sup>7</sup> For channel block assignments in the 38,600–40,000 MHz band, the authorized bandwidth is equivalent to an unpaired channel block assignment or to either half of a symmetrical paired channel block assignment. When adjacent channels are aggregated, equipment is permitted to operate over the full channel block aggregation without restriction.

**Note to Footnote 7:** Unwanted emissions shall be suppressed at the aggregate channel block edges based on the same roll-off rate as is specified for a single channel block in paragraphs 101.111(a)(ii) and (iii) of this chapter.

[61 FR 26677, May 28, 1996, as amended at 61 FR 44181, Aug. 28, 1996; 62 FR 23167, Apr. 29, 1997; 62 FR 24582, May 6, 1997; 63 FR 6105, Feb. 6, 1998; 65 FR 17449, Apr. 3, 2000; 65 FR 38329, June 20, 2000]

### § 101.111 Emission limitations.

(a) The mean power of emissions must be attenuated below the mean output power of the transmitter in accordance with the following schedule:

(1) When using transmissions other than those employing digital modulation techniques:

(i) On any frequency removed from the assigned frequency by more than 50 percent up to and including 100 percent